

Test Mode: IEEE 802.11n HT20 TX
 Test CH1: 2412MHz



Test CH6: 2437MHz



Test CH11: 2462MHz



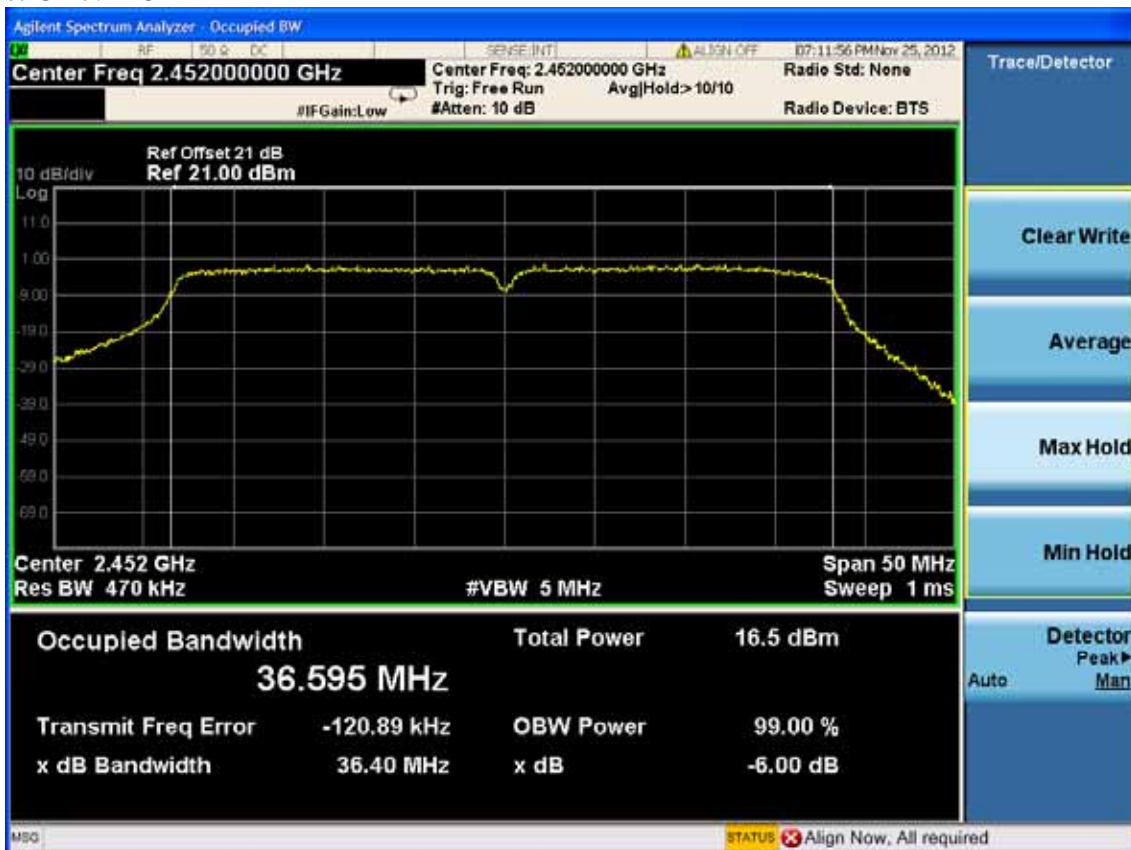
Test Mode: IEEE 802.11n HT40 TX
 Test CH1: 2422MHz



Test CH4: 2437MHz



Test CH7: 2452MHz



8. OUTPUT POWER TEST

8.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Dct.31.12	1 Year
2.	Amp	HP	8449B	3008A08495	May.08, 12	1 Year
3.	Antenna	EMCO	3115	9510-4580	May.08, 12	1Year
4.	HF Cable	Hubersuhne	Sucoflex104	-	May.08, 12	1 Year
5.	Power Meter	Anritsu	ML2487A	6K00002472	May.08, 12	1Year
6.	Power Sensor	Anritsu	MA2491A	033005	May.08, 12	1Year

8.2. Limit (FCC Part 15C 15.247 b(3))

For systems using digital modulation in the 2400—2483.5MHz, The Peak out put Power shall not exceed 1W(30dBm)

8.3. Test Procedure

- 1, Connected the EUT's antenna port to measure device by 26dB attenuator.
- 2, For IEEE 802.11b/g and IEEE802.11n HT20 mode, use a PK power meter which's bandwidth is 20MHz and above 26dB bandwidth of signal to measure out each test modes' PK output power.
- 3, For IEEE802.11n HT40 mode, because the signal's bandwidth is about 40MHz and above 20MHz bandwidth of power sensor ML2491A. So Bandwidth correction method according to ANSI C63.10 clause 6.10.2.1 part (c) was used:
 - 1) Set the RBW=3MHz and VBW =8MHz
 - 2) Turn averaging off
 - 3) Set sweep to automatic
 - 4) Set the span just large enough to capture the emission
 - 5) Use a peak detector on max hold
 - 6) Record the measured power
 - 7) Calculate Output power of EUT use the formula:

$$\text{Peak output power} = \text{measured power} + 10\log[(26\text{dB bandwidth of emission})/(\text{analyzer RBW})]$$

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

8.4. Test Results
Group 1

EUT: A8-Ein Super WiFi Base Station					
M/N: WA8011N					
Test date: 2012-11-24		Pressure: 101.2±1.0 kpa		Humidity: 52.1±3.0%	
Tested by: Leo-Li		Test site: RF Site		Temperature : 22.2±0.6°C	
Cable loss: 1 dB		Attenuator loss: 20 dB		Antenna Gain : 19dBi	
Test Mode	CH (MHz)	Peak output Power (dBm)			Limit (dBm)
		ANT 0	ANT 1	Total	
11b	CH1	13.34	12.78	16.08	17
	CH6	13.41	12.82	16.14	17
	CH11	13.47	12.63	16.08	17
11g	CH1	13.46	12.78	16.14	17
	CH6	13.57	12.71	16.17	17
	CH11	13.52	12.74	16.16	17
11n HT20	CH1	13.28	12.71	16.01	17
	CH6	13.37	12.83	16.12	17
	CH11	13.40	12.89	16.16	17

Test Mode	CH	Result					Limit (dBm)
		Measured power(dBm)/3MHz		PK Output power (dBm)			
		ANT 0	ANT 1	ANT 0	ANT 1	Total	
11n HT40	CH3	1.483	0.722	13.623	12.832	16.26	17
	CH6	1.677	0.917	13.817	13.027	16.45	17
	CH9	1.408	0.876	13.548	12.986	16.29	17
ANT 0:26dB Bandwidth for 11n HT40: 49.06MHz							
ANT 1:26dB Bandwidth for 11n HT40: 48.75MHz							
ANT 0:BW correction factor = 10log[(49.06MHz)/(3MHz)] = 12.14dB							
ANT 1:BW correction factor = 10log[(48.75MHz)/(3MHz)] = 12.11dB							
Conclusion: PASS							

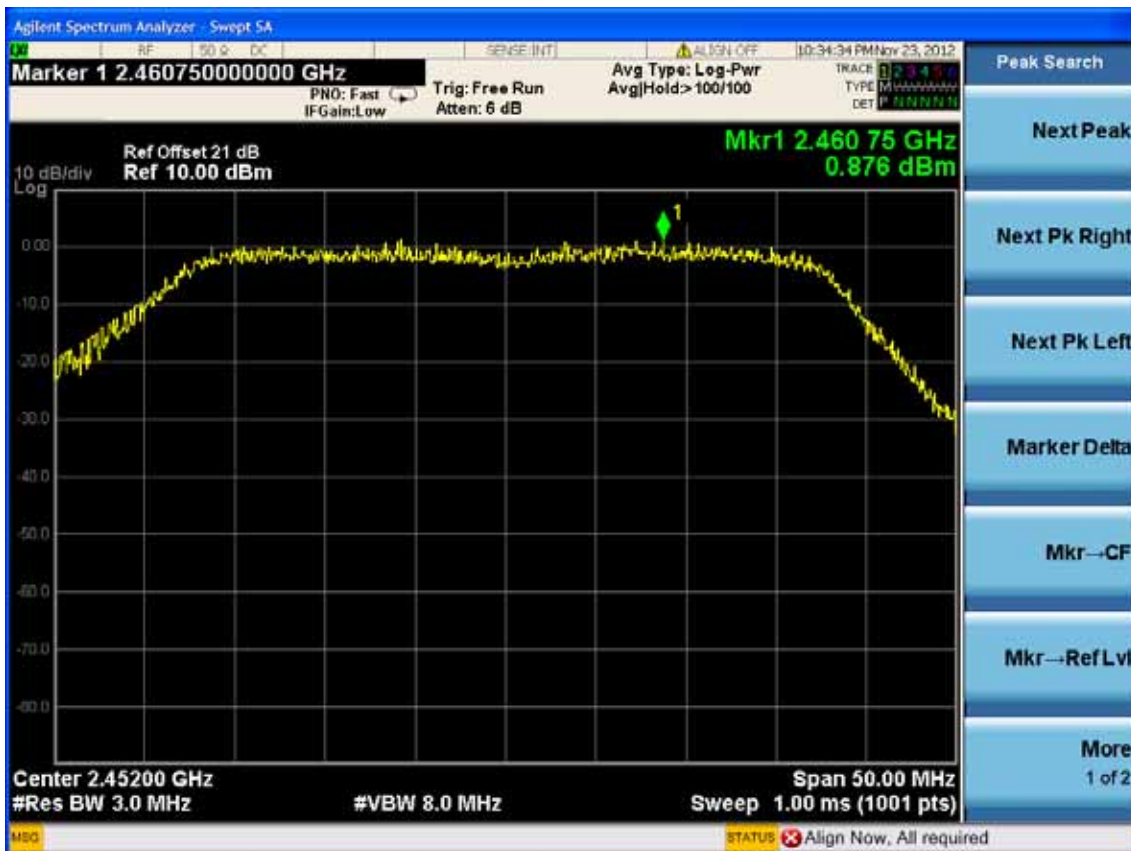
Test Mode: IEEE 802.11n HT40
ANT 0





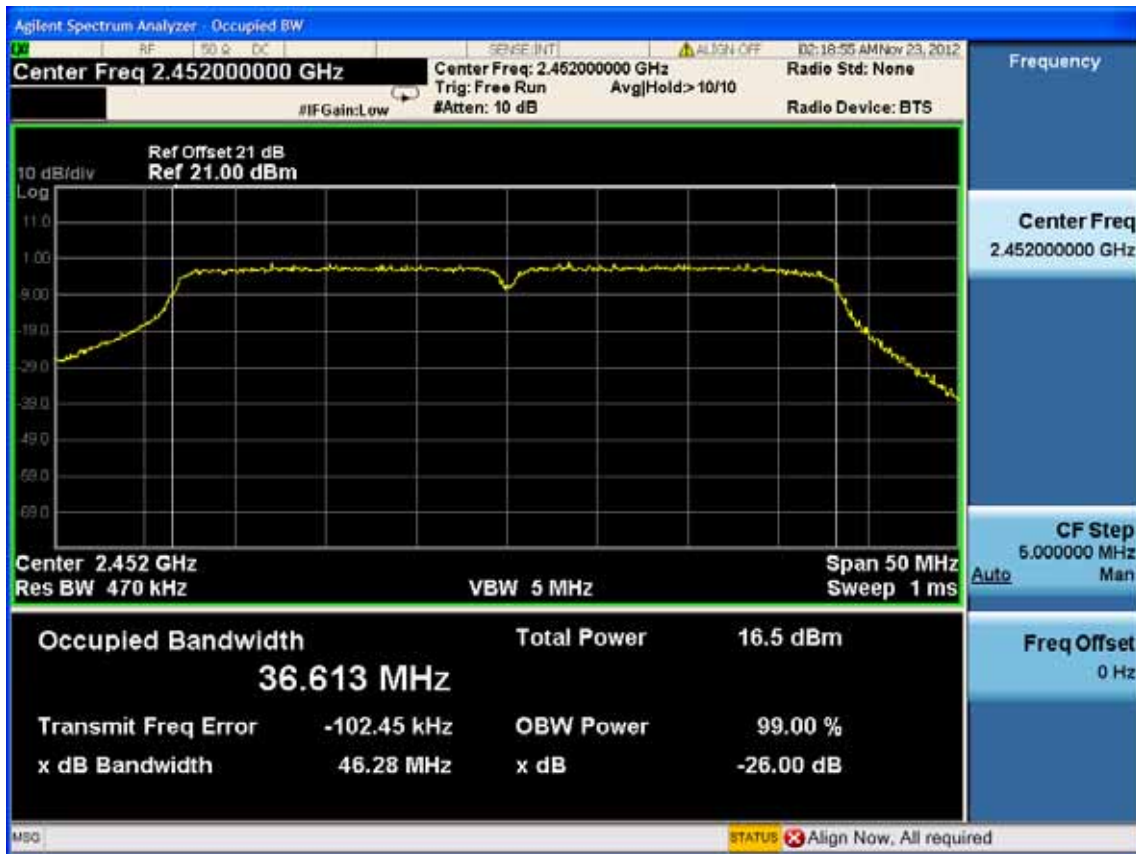
ANT 1





26dB Bandwidth
ANT 0





ANT 1





Group 2

EUT: A8-Ein Super WiFi Base Station					
M/N: WA8011N					
Test date: 2012-11-24		Pressure: 101.2±1.0 kpa		Humidity: 52.4±3.0%	
Tested by: Leo-Li		Test site: RF Site		Temperature : 22.8±0.6°C	
Cable loss: 1 dB		Attenuator loss: 20 dB		Antenna Gain : 19dBi	
Test Mode	CH (MHz)	Peak output Power (dBm)			Limit (dBm)
		ANT 0	ANT 1	Total	
11b	CH1	13.29	12.01	15.71	17
	CH6	13.15	12.11	15.67	17
	CH11	13.32	12.12	15.77	17
11g	CH1	13.29	12.24	15.81	17
	CH6	13.25	12.32	15.82	17
	CH11	13.31	12.21	15.81	17
11n HT20	CH1	13.20	12.74	15.99	17
	CH6	13.27	12.72	16.01	17
	CH11	13.29	12.85	16.09	17

Test Mode	CH	Result					Limit (dBm)
		Measured power(dBm)/3MHz		PK Output power (dBm)			
		ANT 0	ANT 1	ANT 0	ANT 1	Total	
11n HT40	CH3	1.188	0.876	13.278	12.976	16.14	17
	CH6	1.358	0.756	13.448	12.856	16.17	17
	CH9	1.382	0.758	13.472	12.858	16.19	17

ANT 0:26dB Bandwidth for 11n HT40: 48.50MHz

ANT 1:26dB Bandwidth for 11n HT40: 48.71MHz

 ANT 0:BW correction factor = $10\log[(48.50\text{MHz})/(3\text{MHz})] = 12.09\text{dB}$

 ANT 1:BW correction factor = $10\log[(48.71\text{MHz})/(3\text{MHz})] = 12.10\text{dB}$
Conclusion: PASS

Test Mode: IEEE 802.11n HT40
ANT 0





ANT 1





26dB Bandwidth
ANT 0





ANT 1





Group 3

EUT: A8-Ein Super WiFi Base Station					
M/N: WA8011N					
Test date: 2012-11-24		Pressure: 101.2±1.0 kpa		Humidity: 53.5±3.0%	
Tested by: Leo-Li		Test site: RF Site		Temperature : 22.6±0.6°C	
Cable loss: 1 dB		Attenuator loss: 20 dB		Antenna Gain : 19dBi	
Test Mode	CH (MHz)	Peak output Power (dBm)			Limit (dBm)
		ANT 0	ANT 1	Total	
11b	CH1	13.15	12.91	16.04	17
	CH6	13.30	12.92	16.12	17
	CH11	13.13	12.01	15.62	17
11g	CH1	13.17	12.93	16.06	17
	CH6	13.34	12.24	15.84	17
	CH11	13.29	12.18	15.78	17
11n HT20	CH1	13.19	12.57	15.90	17
	CH6	13.31	12.64	16.00	17
	CH11	13.27	12.71	16.01	17

Test Mode	CH	Result					Limit (dBm)
		Measured power(dBm)/3MHz		PK Output power (dBm)			
		ANT 0	ANT 1	ANT 0	ANT 1	Total	
11n HT40	CH3	1.095	0.848	13.235	12.958	16.11	17
	CH6	1.514	0.841	13.654	12.951	16.33	17
	CH9	1.197	0.852	13.337	12.962	16.16	17
ANT 0:26dB Bandwidth for 11n HT40: 49.10MHz							
ANT 1:26dB Bandwidth for 11n HT40: 48.76MHz							
ANT 0:BW correction factor = 10log[(49.10MHz)/(3MHz)] = 12.14dB							
ANT 1:BW correction factor = 10log[(48.76MHz)/(3MHz)] = 12.11dB							
Conclusion: PASS							

Test Mode: IEEE 802.11n HT40
ANT 0



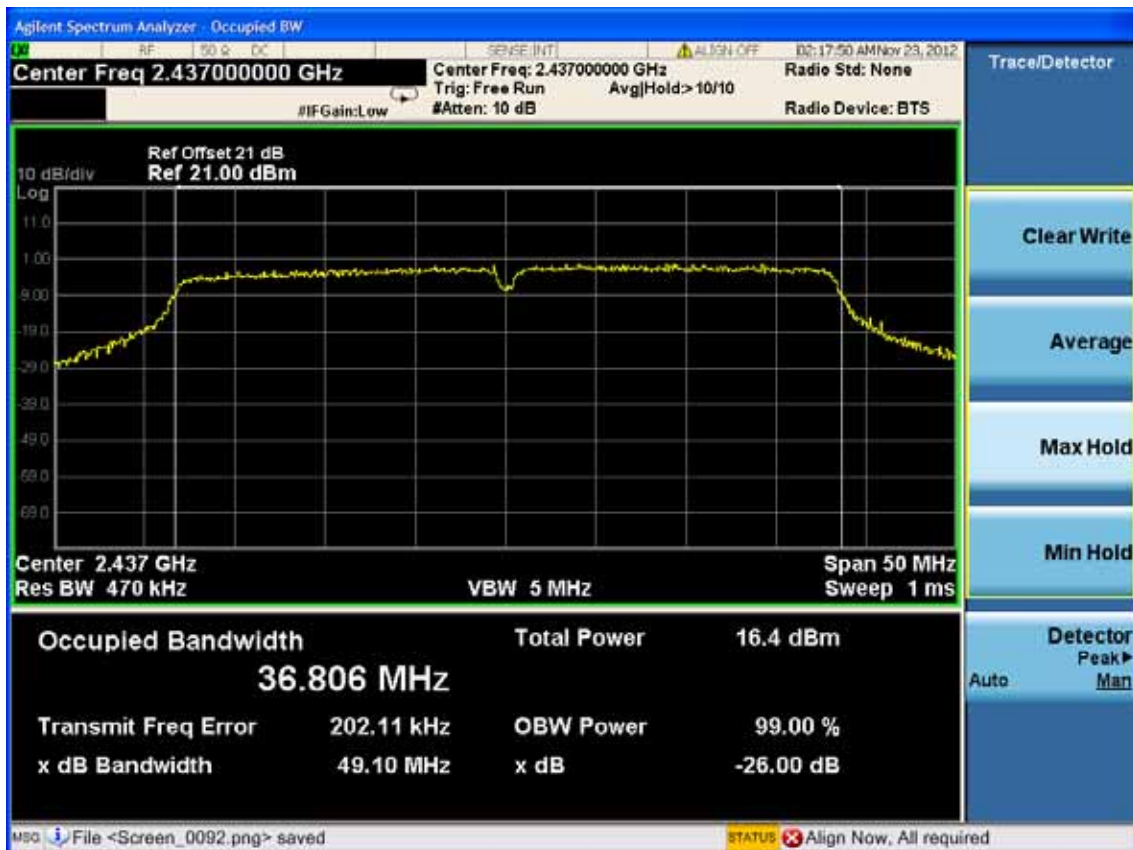


ANT 1



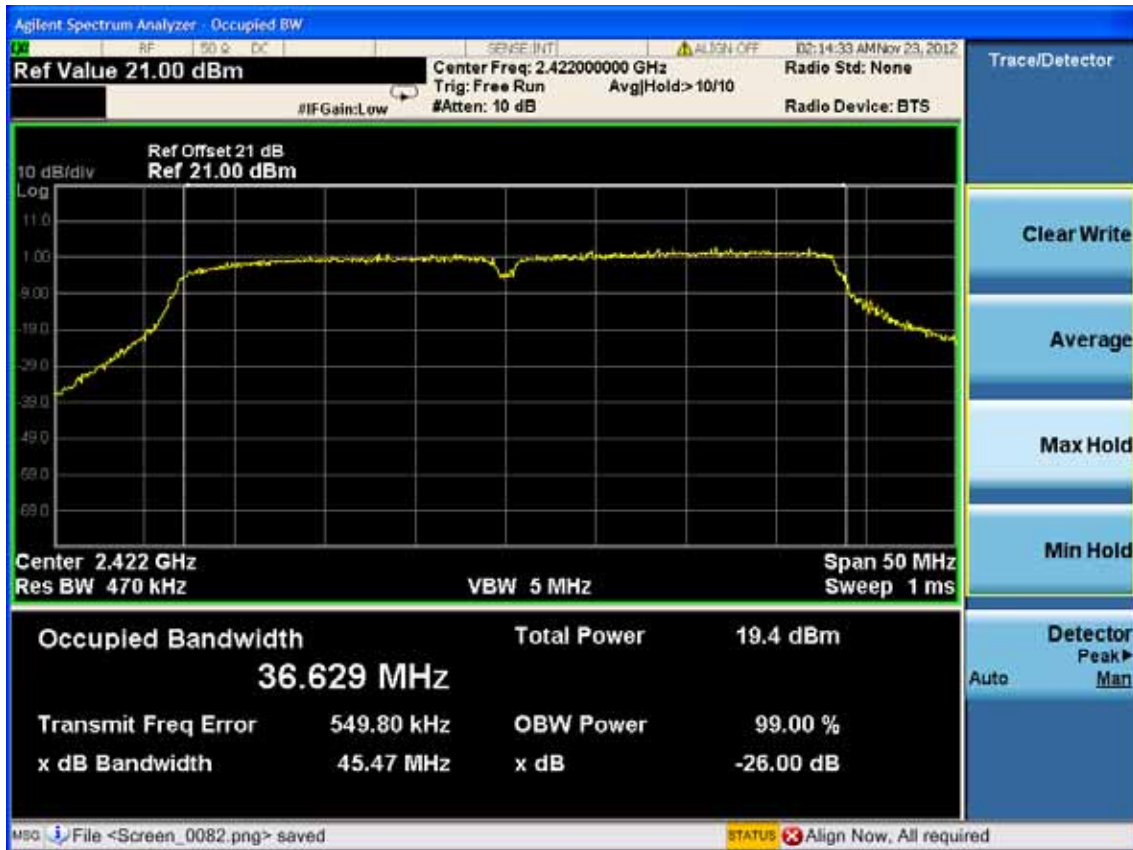


26dB Bandwidth
ANT 0





ANT 1



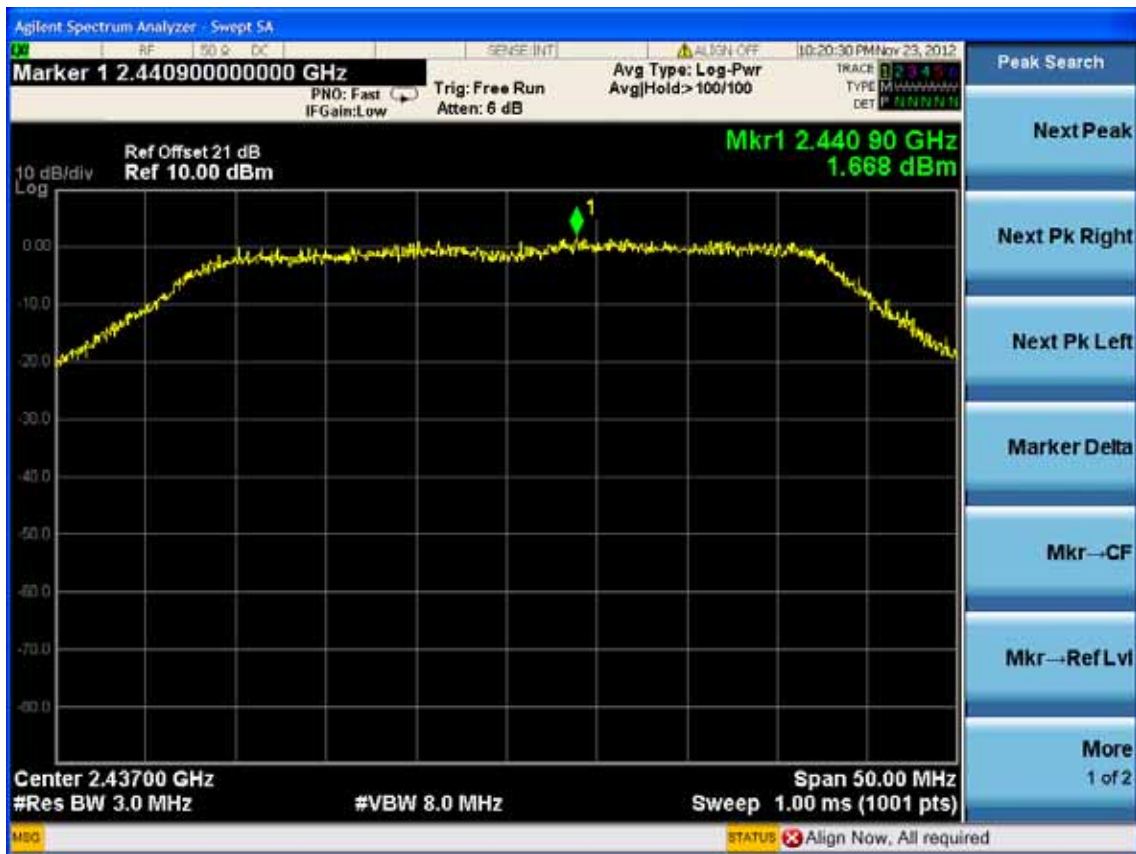


Group 4

EUT: A8-Ein Super WiFi Base Station					
M/N: WA8011N					
Test date: 2012-11-24		Pressure: 101.2±1.0 kpa		Humidity: 53.2±3.0%	
Tested by: Leo-Li		Test site: RF Site		Temperature : 23.1±0.6°C	
Cable loss: 1 dB		Attenuator loss: 20 dB		Antenna Gain : 19dBi	
Test Mode	CH (MHz)	Peak output Power (dBm)			Limit (dBm)
		ANT 0	ANT 1	Total	
11b	CH1	13.15	12.84	16.01	17
	CH6	13.01	12.77	15.90	17
	CH11	13.13	12.81	15.98	17
11g	CH1	13.22	12.89	16.07	17
	CH6	13.32	12.91	16.13	17
	CH11	13.19	12.87	16.04	17
11n HT20	CH1	13.17	12.72	15.96	17
	CH6	13.24	12.65	15.97	17
	CH11	13.13	12.69	15.93	17

Test Mode	CH	Result					Limit (dBm)
		Measured power(dBm)/3MHz		PK Output power (dBm)			
		ANT 0	ANT 1	ANT 0	ANT 1	Total	
11n HT40	CH3	0.925	0.889	13.045	13.009	16.04	17
	CH6	1.668	0.779	13.788	12.899	16.38	17
	CH9	1.256	0.760	13.376	12.880	16.15	17
ANT 0:26dB Bandwidth for 11n HT40: 48.83MHz							
ANT 1:26dB Bandwidth for 11n HT40: 48.88MHz							
ANT 0:BW correction factor = 10log[(48.83 MHz)/(3MHz)] = 12.12dB							
ANT 1:BW correction factor = 10log[(48.88MHz)/(3MHz)] = 12.12dB							
Conclusion: PASS							

Test Mode: IEEE 802.11n HT40
ANT 0





ANT 1





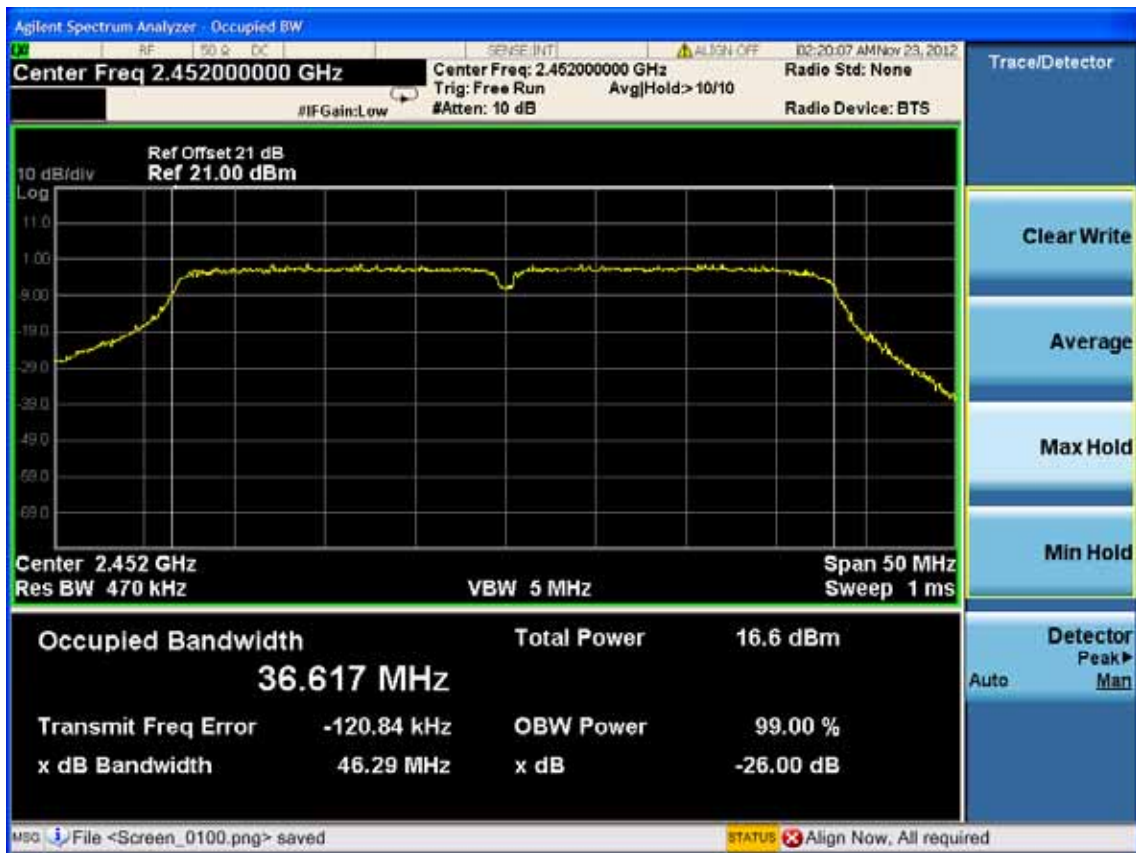
26dB Bandwidth
ANT 0





ANT 1





9. POWER SPECTRAL DENSITY TEST

9.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Dct.31.12	1 Year
2.	Amp	HP	8449B	3008A08495	May.08, 12	1 Year
3.	Antenna	EMCO	3115	9510-4580	May.31, 12	1 Year
4.	HF Cable	Hubersuhne	Sucoflex104	-	May.08, 12	1 Year

9.2. Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

9.3. Test Procedure

1. Connected the EUT's antenna port to spectrum analyzer device by 20dB attenuator.
2. Set the test frequency as center frequency, Set RBW=100KHz, VBW=300KHz, Span to 5-30 % greater than the EBW, Read out maximum peak level of the test frequency.
- 3, adjusting (reducing) the measured power in step 2 by a bandwidth correction factor (BWCF) where $BWCF = 10\log(3 \text{ kHz}/100 \text{ kHz} = -15.2 \text{ dB})$

Note: The cable loss and attenuator loss were offset into measure device as an amplitude

9.4. Test Results

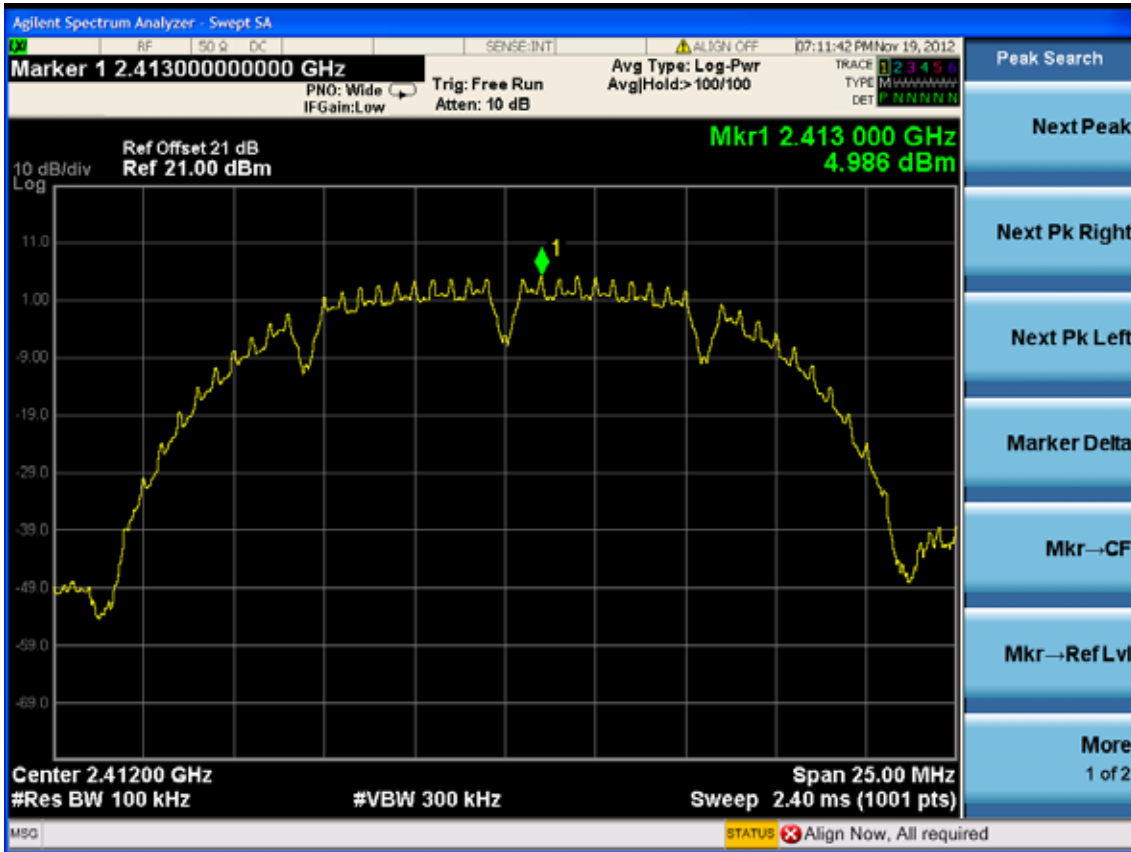
EUT: A8-Ein Super WiFi Base Station		
M/N: WA8011N		
Test date: 2012-11-25	Pressure: 101.3±1.0 kpa	Humidity: 53.2±3.0%
Tested by: Leo-Li	Test site: RF Site	Temperature : 22.1±0.6°C

Cable loss: 1 dB		Attenuator loss: 20 dB				
Test Mode	CH	Power density (dBm/100KHz)			Power density (dBm/3KHz)	Limit (dBm/3KHz)
		ANT 0	ANT 1	Total	ANT 1	
11b	CH1	4.986	4.648	7.83	-7.37	8
	CH6	5.755	6.433	9.12	-6.08	8
	CH11	3.453	4.319	6.92	-8.28	8
11g	CH1	2.511	3.040	5.79	-9.41	8
	CH6	3.583	4.121	6.87	-8.33	8
	CH11	1.374	2.264	4.85	-10.35	8
11n HT20	CH1	3.263	3.065	6.18	-9.02	8
	CH6	3.623	3.882	6.76	-8.44	8
	CH11	1.843	2.128	5.00	-10.20	8
11n HT40	CH1	3.560	2.130	5.91	-9.29	8
	CH4	2.008	0.927	4.51	-10.69	8
	CH7	1.523	0.499	4.05	-11.15	8
BW correction factor = 10log[(3/100KHz)] = -15.2						
Conclusion : PASS						

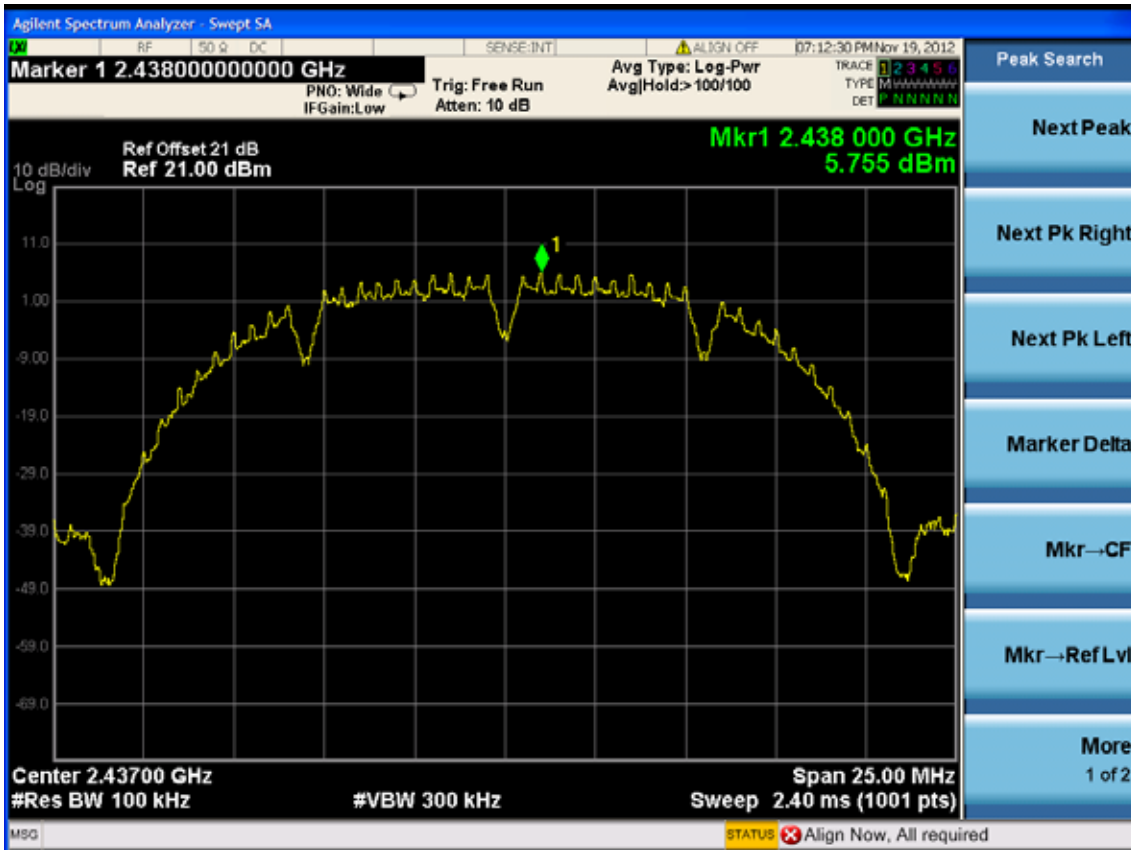
ANT 0

Test Mode: IEEE 802.11b TX

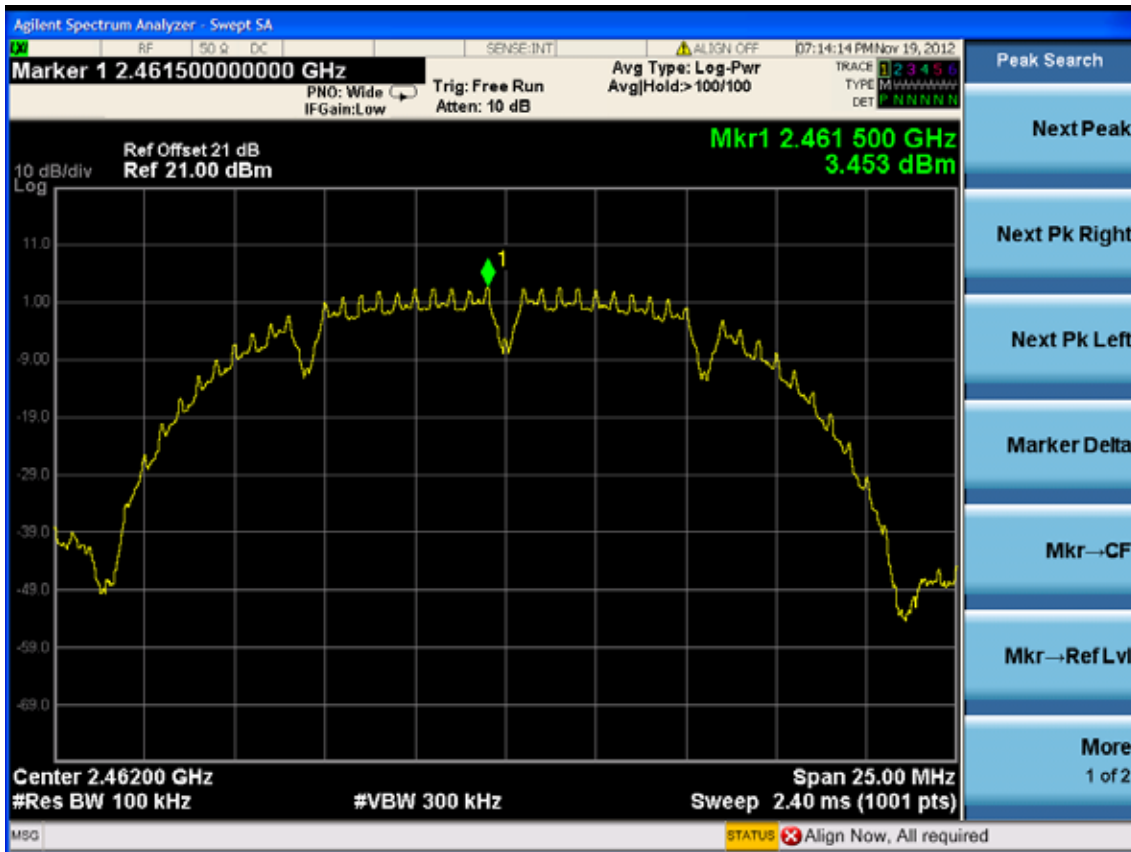
Test CH1: 2412MHz



Test CH6: 2437MHz



Test CH11: 2462MHz



Test Mode: IEEE 802.11g TX

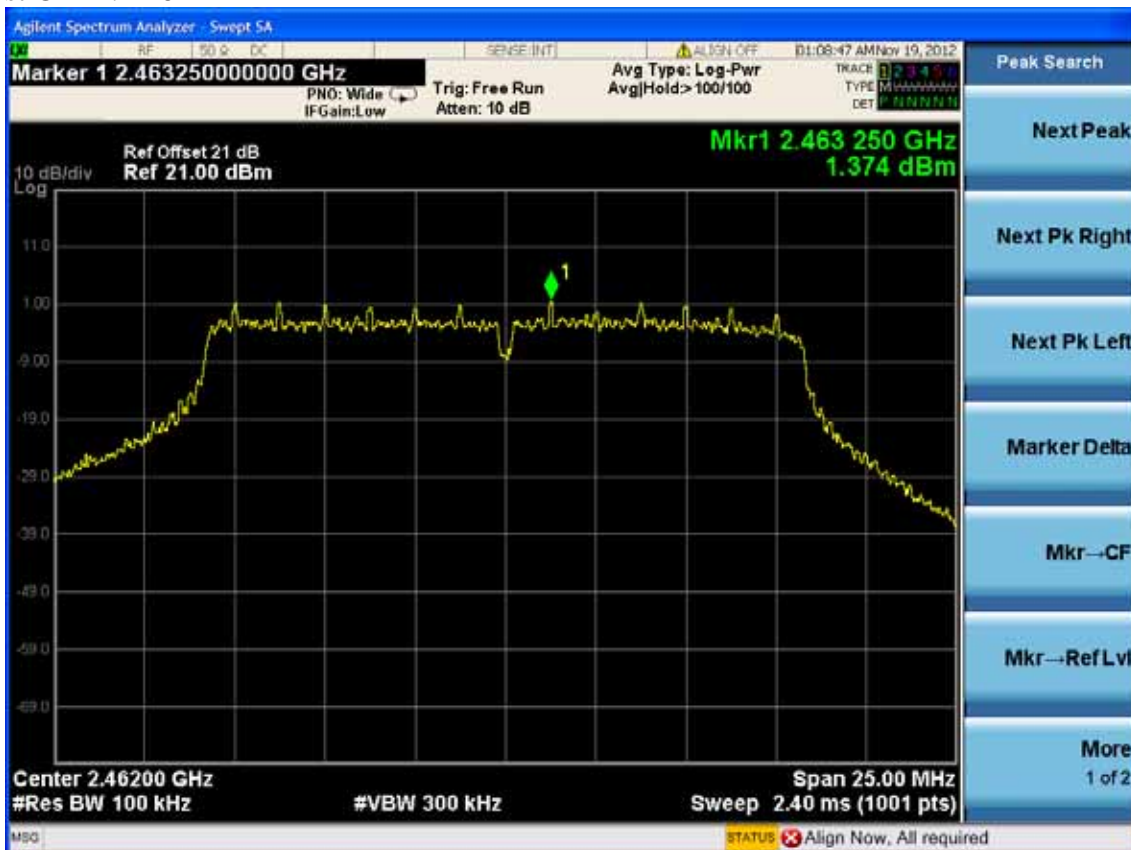
Test CH1: 2412MHz



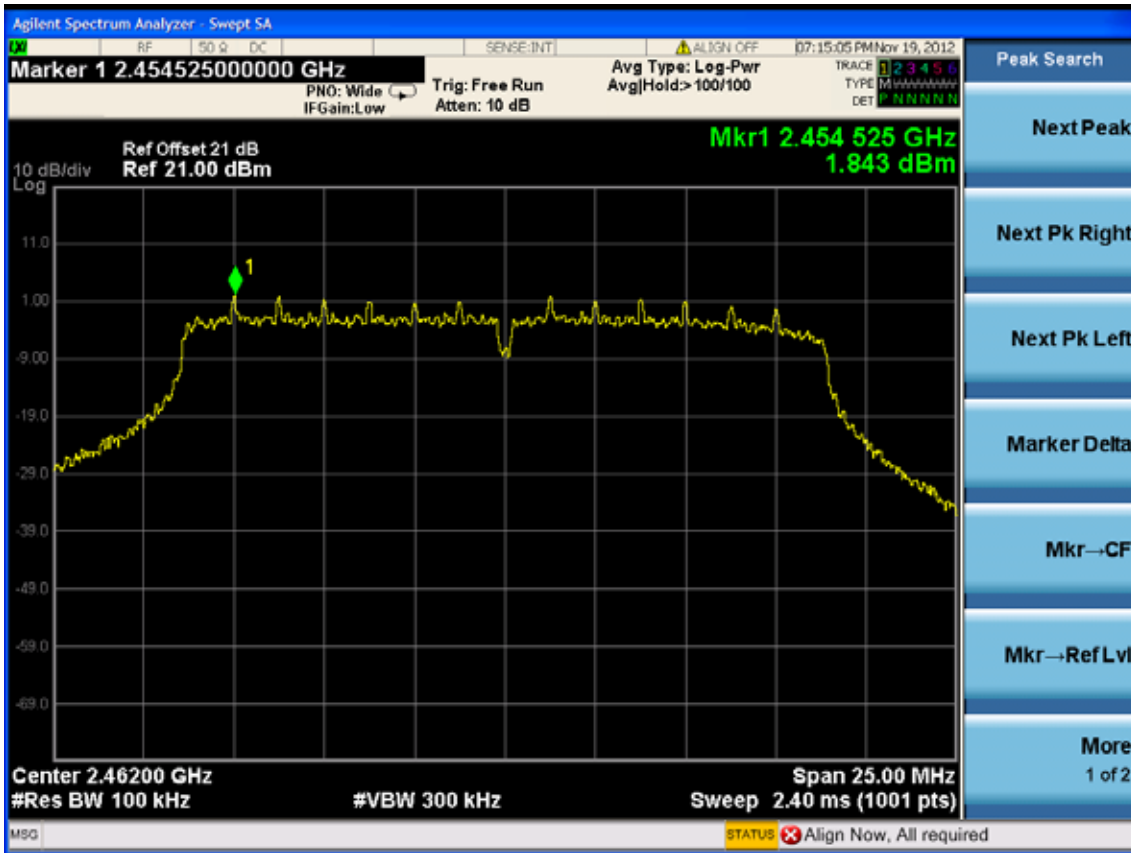
Test CH6: 2437MHz



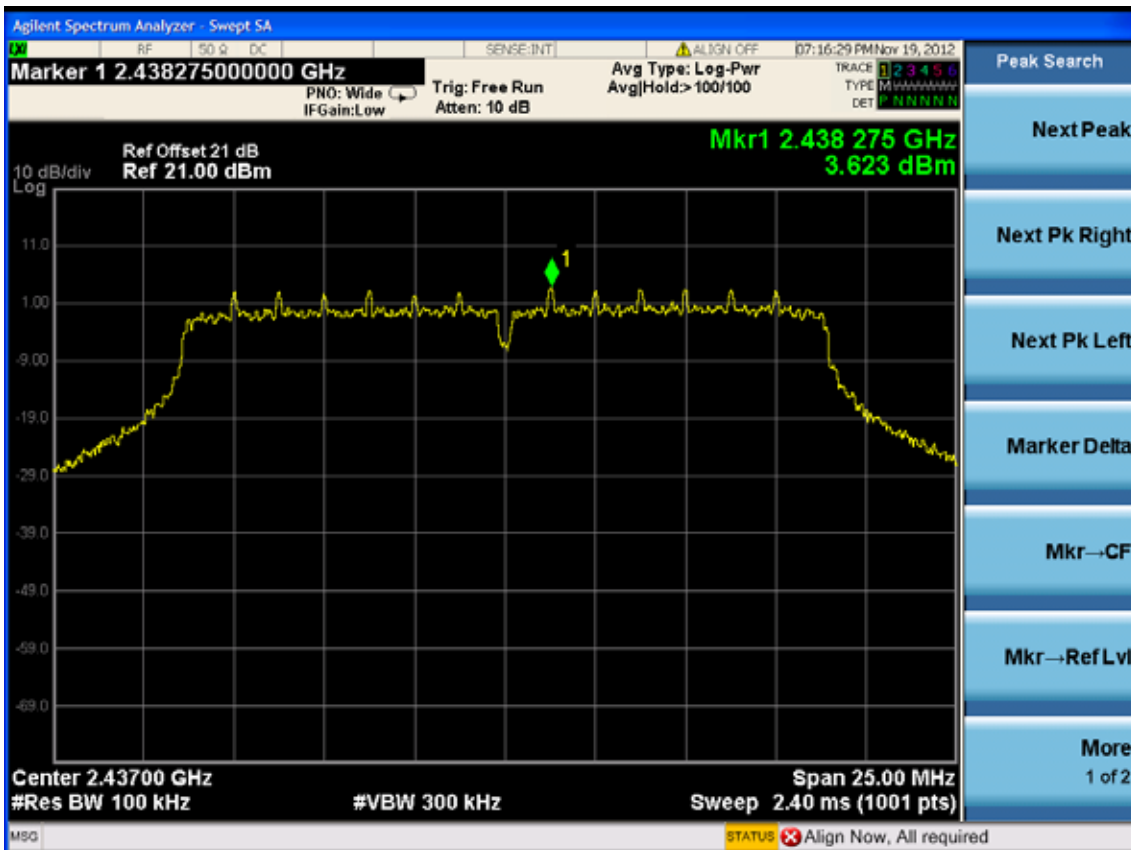
Test CH11: 2462MHz



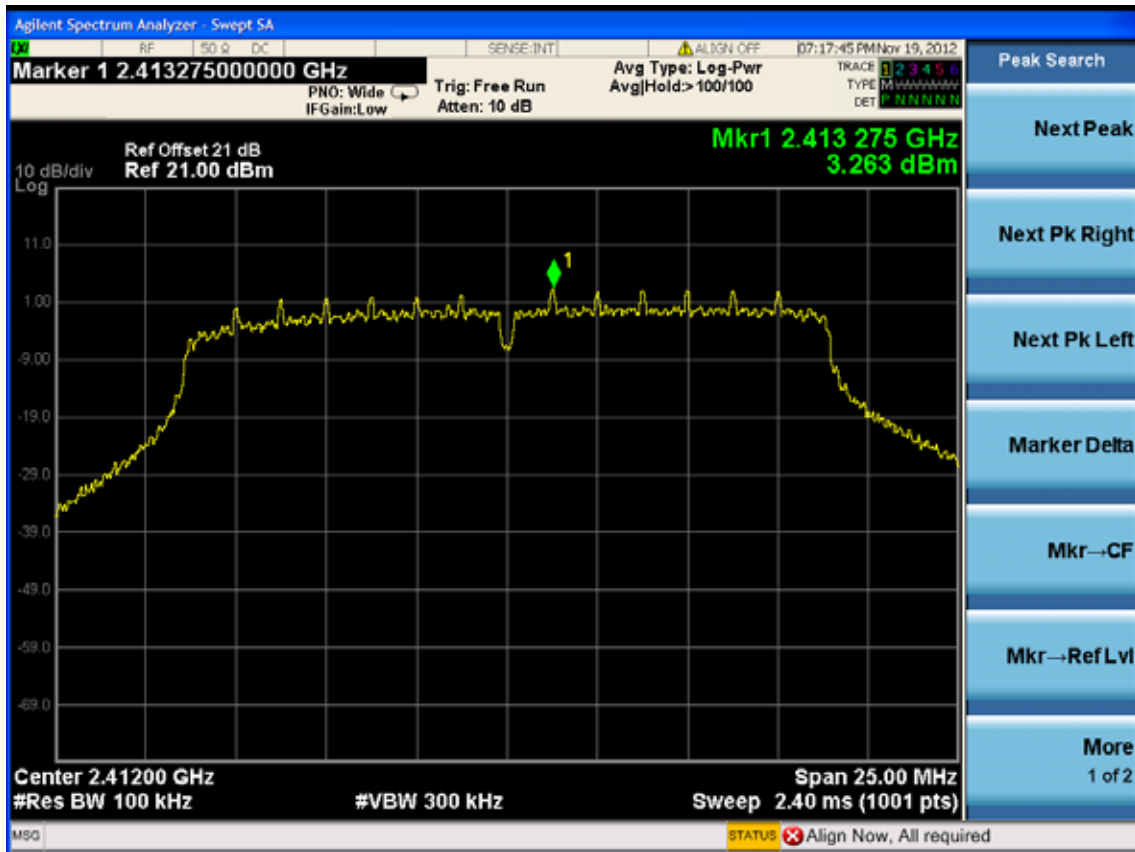
Test Mode: IEEE 802.11n HT20 TX
 Test CH1: 2412MHz



Test CH6: 2437MHz



Test CH11: 2462MHz



Test Mode: IEEE 802.11n HT40 TX

Test CH1: 2422MHz



Test CH4: 2437MHz



Test CH7: 2452MHz



ANT 1

Test Mode: IEEE 802.11b TX

Test CH1: 2412MHz



Test CH6: 2437MHz



Test CH11: 2462MHz



Test Mode: IEEE 802.11g TX

Test CH1: 2412MHz



Test CH6: 2437MHz



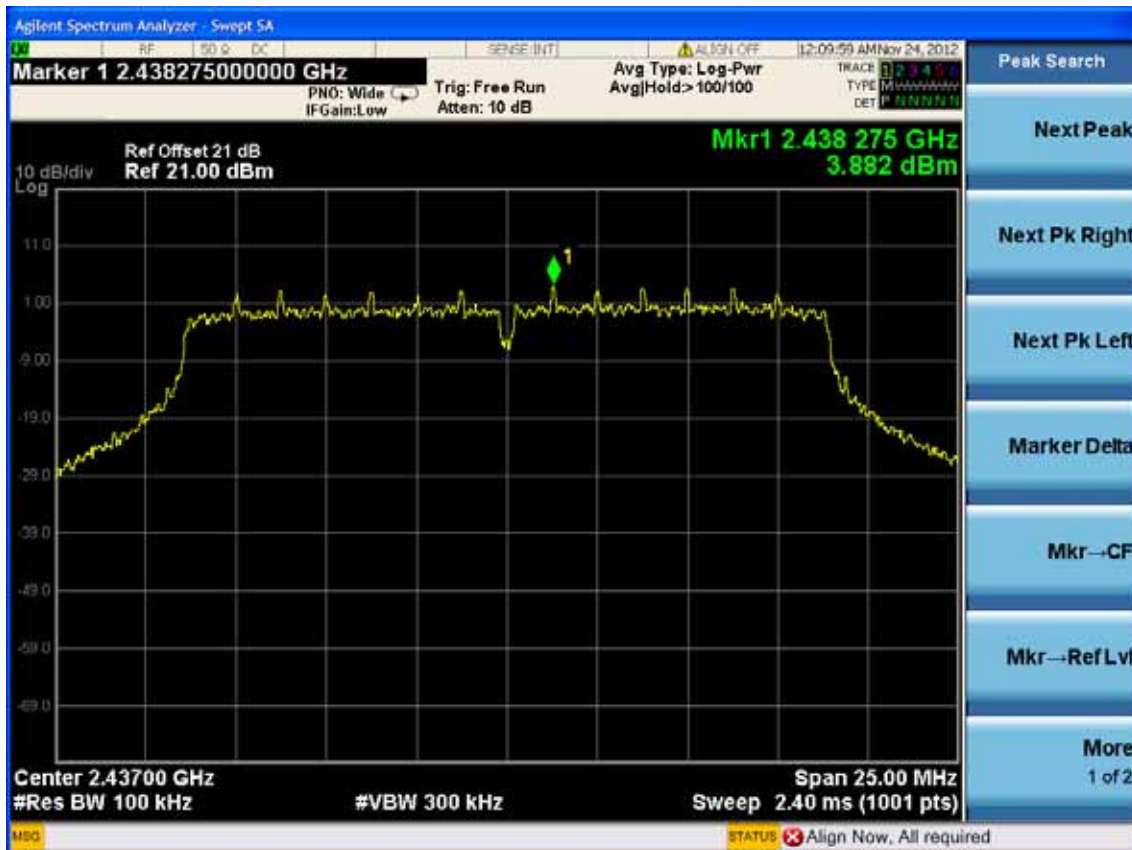
Test CH11: 2462MHz



Test Mode: IEEE 802.11n HT20 TX
 Test CH1: 2412MHz



Test CH6: 2437MHz

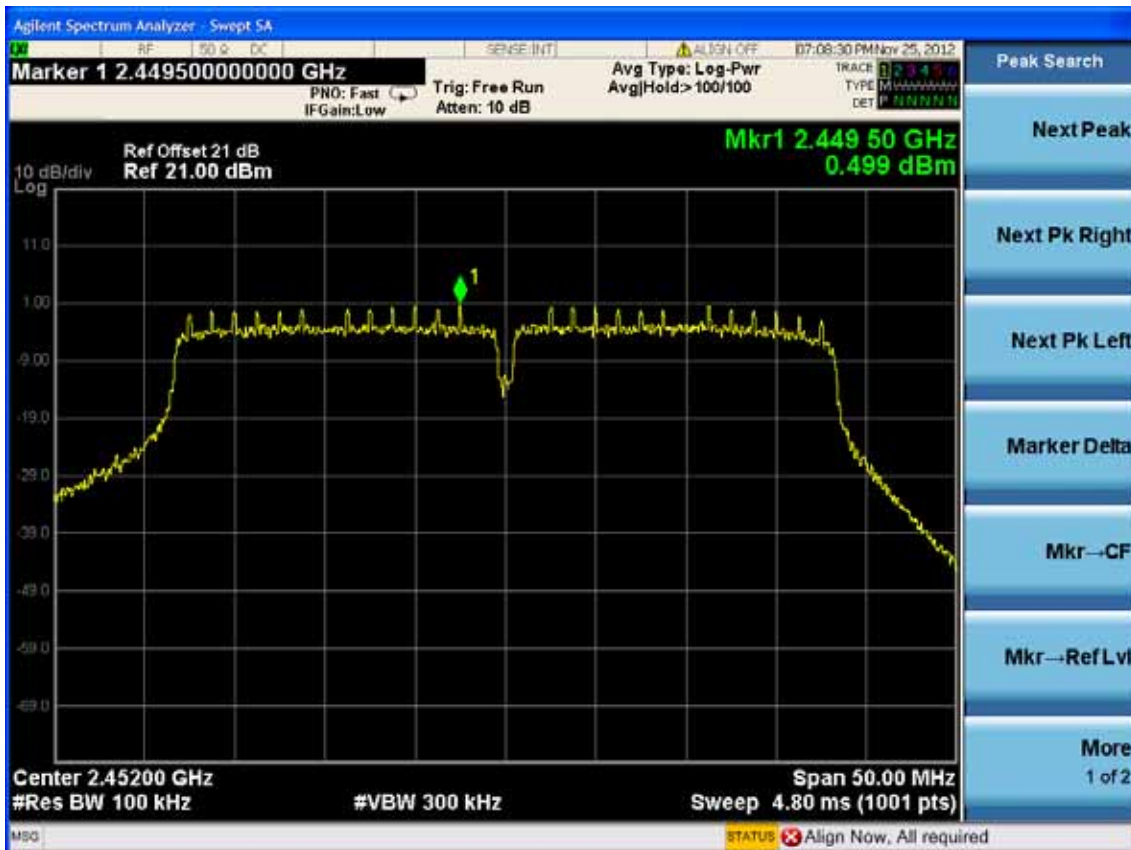


Test CH11: 2462MHz



Test Mode: IEEE 802.11n HT40 TX

Test CH1: 2422MHz



Test CH4: 2437MHz



Test CH7: 2452MHz



10. ANTENNA REQUIREMENT

10.1. STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

10.2. ANTENNA CONNECTED CONSTRUCTION

The antennas used for this product are Dipole antenna that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is 19dBi.

11.MPE ESTIMATION

11.1.Limit for General Population/ Uncontrolled Exposures

Frequency	Power density (mW/ cm ²)	Averaging time(minutes)
300MHz----1.5GHz	F/1500	30
1.5GHz---100GHz	1.0	30

Frequency(MHz)	Power density (mW/ cm ²)	Averaging time(minutes)
2412	1	30
2437	1	30
2462	1	30

Note: F= Frequency in MHz

11.2. Estimation Result

EUT: A8-Ein Super WiFi Base Station		
M/N: WA8011N		
Test date: 2012-11-25	Pressure: 101.4±1.0 kpa	Humidity: 55.6±3.0%
Tested by: Leo-Li	Test site: RF Site	Temperature : 22.4±0.6 °C

Cable loss: 1 dB		Attenuator loss: 20 dB				Antenna Gain: 19 dBi	
Test Mode	CH	Frequency (MHz)	Peak Output Power (dBm)	Output Power (mW)	Antenna Gain (dBi)	Antenna Gain (Linear)	MPE
11b	CH1	2412	16.08	40.55	19	79.43	0.6411
	CH6	2437	16.14	41.11	19	79.43	0.6501
	CH11	2462	16.08	40.55	19	79.43	0.6411
11g	CH1	2412	16.14	41.11	19	79.43	0.6501
	CH6	2437	16.17	41.40	19	79.43	0.6546
	CH11	2462	16.16	41.30	19	79.43	0.6531
11n HT20	CH1	2412	16.01	39.90	19	79.43	0.6309
	CH6	2437	16.12	40.93	19	79.43	0.6471
	CH11	2462	16.16	41.30	19	79.43	0.6531
11n HT40	CH1	2422	16.26	42.27	19	79.43	0.6683
	CH4	2437	16.45	44.16	19	79.43	0.6982
	CH7	2452	16.29	42.56	19	79.43	0.6729

12.DEVIATION TO TEST SPECIFICATIONS

[NONE]